Data Evaluation Report on the Reproductive Effects of BAS 800 H (Saflufenacil) on Mallard Duck (*Anas platyrhynchos*)

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	EPA MRID	47127916
	EPA Guideline	OPPTS 850.2300

Test material: BAS 800 H **Purity:** 93.8%
Common name Saflufenacil
Chemical name:
IUPAC: *N'*-{2-chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-pyrimidin-1-yl]benzoyl}-*N*-isopropyl-*N*-methylsulfamide
CAS: 2-chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2*H*)-pyrimidinyl]-4-fluoro-*N*-[[methyl(1-methylethyl)amino]sulfonyl]benzamide
CAS No.: 372137-35-4
Synonyms: None reported

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Company Code	BAZ
Active Code	SFF
Use Site Category	13 (terrestrial feed crops) and 14 (terrestrial food crops)
EPA PC Code	118203

CITATION: Zok, S. 2006. BAS 800 H – 1-Generation Reproduction Study on the Mallard Duck (*Anas platyrhynchos*) by Administration in the Diet. Unpublished study performed by Experimental Toxicology and Ecology, BASF Aktiengesellschaft, Ludwigshafen/Rhein, Germany. Laboratory Report No. 72W0414/015149. Study sponsored by BASF Corporation, Research Triangle Park, NC. Study initiated January 27, 2006 and submitted December 20, 2006.

DISCLAIMER: This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the reproductive effects of a pesticide on avian species. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-by-case basis, whether it is scientifically sound and provides sufficient information to satisfy applicable data

requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.

EXECUTIVE SUMMARY

The one-generation reproductive toxicity of BAS 800 H (saflufenacil) to 16 pairs per level of *ca.* 5-month old mallard duck (*Anas platyrhynchos*) was assessed over 20 weeks. BAS 800 H was administered to the birds in the diet at nominal concentrations of 0 (control), 100, 300, and 1000 mg a.i./kg diet (adjusted for purity). Mean-measured concentrations were <10.0 (<LOQ, control), 95.0, 279, and 940 mg a.i./kg diet, respectively. Daily doses of the three treatment levels, based on measured concentrations of technical substance, were 12.8, 37.0, and 114.5 mg a.i./kg bw, respectively.

A significant (p=0.01), but slight (3%) reduction was detected for the proportion of live 3-week embryos to viable embryos at the highest treatment level. No other biologically-significant treatment-related effects were observed on any adult or offspring parameter at any concentration level. Based on these results, the NOAEC and LOAEC were 279 and 940 mg a.i./kg (37 and 114.5 mg a.i./kg bw, respectively).

This study is classified as **ACCEPTABLE** to **U.S EPA** and as **FULLY RELIABLE** to **PMRA and APVMA** as it is scientifically sound and satisfies the guideline requirement for a mallard duck (*Anas platyrhynchos*) reproductive toxicity study.

Results Synopsis

Test Organism Size/Age (mean Weight): *ca.* 5-months old; 1066.3-1136.3 g (combined sexes)

NOAEC: 279 mg a.i./kg (37 mg a.i./kg bw)
LOAEC: 940 mg a.i./kg (114.5 mg a.i./kg bw)
Most Sensitive Endpoint(s): proportion of live 3-week embryos to viable embryos

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The study protocol was based on procedures outlined in the U.S. EPA *Pesticide Assessment Guidelines,* §71-4 (1982) taking into account the U.S. EPA Standard Evaluation Procedure (SEP), EPA 540/9-86-139 (1986); OECD Guideline No. 206 (1984); and U.S. EPA Ecological Effects Test Guidelines, OPPTS 850.2300 (1996). There were no deviations from OECD Guideline No. 206 noted. Deviations from OPPTS Guideline No. 850.2300 included:

1. The initial age of the test birds (*ca.* 5 months) was younger than recommended (at least 30 weeks old).
2. Cage size was significantly smaller than recommended. OPPTS recommends at least 10,000 cm^2 per bird. In this study, the floor space was only 4225 cm^2 per bird.

These deviations do not affect the scientific soundness of this study.

COMPLIANCE: Signed and dated GLP, Quality Assurance and Data Confidentiality statements were provided.

A. MATERIALS:

1. Test Material BAS 800 H

Description: Solid, light beige

Lot No./Batch No. : COD-000515

Purity: 93.8%

Stability of compound under test conditions: The stability of BAS 800 H was assessed in treated feed prepared at all treatment levels after 9 days of ambient storage (including 7 days in open feeders) during Week 1 (batch test diets were prepared 2 days prior to test initiation). Recoveries averaged 90.2-92.1% of nominal concentrations.

(OECD recommends water solubility, stability in water and light, pKa, Pow, and vapor pressure of test compound)

Storage conditions of test chemicals: Room temperature

Physicochemical properties of saflufenacil.

Parameter	Values	Comments
Water solubility at 20°C	2.1 g/L	pH 7
Vapor pressure	4.5×10^{-15} Pa	20°C
UV absorption	272 nm	pH1/pH7
pKa	Neutral	Ambient pH
Kow	Log P_{ow} 2.6	20°C

2. Test organism:

Table 1: Test organism.

Parameter	Details	Remarks *Criteria*
Species (common and scientific names):	Mallard duck (*Anas platyrhynchos*)	Birds were from the same hatch, and were phenotypically indistinguishable from wild birds. *Recommended species include a wild waterfowl species, preferably the mallard (Anas platyrhynchos) or an upland game species, preferably the northern bobwhite (Colinus virginianus)*
Age at Study Initiation:	*Ca.* 5 months old	Birds were younger than recommended (≥30 weeks). It was stated that birds were approaching their first breeding season. *Birds approaching their first breeding season should be used.*
Body Weight: (mean and range)	Males: group means of 1106.6 to 1136.3 g. Females: group means of 1066.3 to 1084.6 g.	Body weights were recorded at weeks 0, 2, 4, 6, 8, and 20 (adult termination). Individual body weights were not provided. *Body weights should be recorded at test initiation and at biweekly intervals up to week eight or up to the onset of egg laying and at termination.*

Parameter	Details	Remarks *Criteria*
Source:	Geflügelhof Knerr, Rieschweiler-Mühlbach, Germany	*All birds should be from the same source.*

B. STUDY DESIGN:

1. Experimental Conditions

a. Range-finding study: None reported.

b. Definitive Study

Table 2: Experimental Parameters.

Parameter	Details	Remarks *Criteria*
Acclimation period: Conditions (same as test or not): Feeding: Health (any mortality observed):	2 weeks Same as test "Provimi Kliba SA" commercial diet for quails and ducks in meal form (Kaiseraugst, Basel, Switzerland) and municipal water from the city of Frankenthal were offered *ad libitum* No mortality reported during acclimation.	During acclimation, birds were inspected daily for health and received 7 hours of light/day. *Recommended observation period includes a 2-3 week health observation period prior to selection of birds for treatment. Generally, birds should be healthy without excess mortality. Feeding should be ad libitum, and sickness, injuries or mortality should be noted.*
Test duration pre-laying exposure: egg-laying exposure:	 9 weeks 11 weeks	Duration of the pre egg-laying period is acceptable under OPPTS guidance.

Parameter	Details	Remarks *Criteria*
withdrawal period, if used:	N/A	***Recommended pre-laying exposure duration:*** *At least 10 weeks prior to the onset of egg-laying.* ***Recommended exposure duration with egg-laying:*** *At least 10 weeks.* ***Recommended withdrawal period:*** *If reduced reproduction is evident, a withdrawal period of up to 3 weeks should be added to the test phase.*
Pen (for parental and offspring) size:	Parents (one pair) were housed in battery cages measuring 1.3 x 0.65 x 1.3 m. Offspring (by set and group) were housed in pens measuring 1.3 x 1.95 m for egg-laying weeks -1 and 1, 1.3 x 3.25 m for egg-laying weeks 2 through 8 and 10, and 1.3 x 2.6 m for egg-laying week 9.	Cage size was significantly smaller than recommended. OPPTS recommends at least 10,000 cm^2 per bird. In this study, the floor space was only 4225 cm^2 per bird. Cage sizes smaller than recommended should be shown to not adversely affect the health or reproduction of the ducks.
construction materials:	Parental and offspring pens were constructed of galvanized or stainless steel wire mesh.	The parental ducks received a daily shower with the water hose when the cages were cleaned.
number:	16 parental pens/treatment level. Hatchlings were group-housed according to the appropriate parental concentration.	*Pens* *Pens should have adequate room and be arranged to prevent cross-contamination.* *Materials* *Recommended materials include nontoxic material and nonbinding material, such as galvanized steel.* *Number* *At least 5 replicate pens should be used for mallards housed in groups of 7. For other arrangements, at least 12 pens should be used, but considerably more may be used if birds are kept in pairs. Chicks should be housed according to parental grouping.*
Number of birds per pen (male:female)	2 birds/pen (1 male:1 female)	

Parameter	Details	Remarks *Criteria*
		One male and one female per pen should be used. For quail, one male and two females should be used. For ducks, two males and five females should be used.

Parameter	Details	Remarks *Criteria*
Number of pens per group/treatment negative control: solvent control: treated:	16 pens N/A 16 pens/treatment	During the pre-egg-laying period, two additional replicates with spare birds were maintained for each of the four test groups under the same conditions. *At least 12-16 pens should be used, but considerably more if birds are kept in pairs.*
Test concentrations (mg a.i./kg diet) nominal: measured:	0 (control), 100, 300, and 1000 mg a.i./kg diet <10.0 (<LOQ, control), 95.0, 279, and 940 mg a.i./kg diet, respectively (equivalent to 12.8, 37.0, and 114.5 mg a.i./kg bw, respectively)	Nominal concentrations were adjusted for the purity of the test substance. Measured concentrations were determined at all levels on Days -2 (fresh diet mixes), 7 (from feed hoppers), 70 (from storage containers), and 133 (from storage containers). Measured concentrations ranged from 90-102% of nominal concentrations, and averaged 93-95% for all treatment levels. *Recommended test concentrations include at least two concentrations other than the control; three or more will provide a better statistical analysis. The highest test concentrations should show a significant effect or be at or above the actual or expected field residue level.*
Maximum labeled field residue anticipated and source of information:	Not specified	It was reported that the U.S. EPA recommends an upper limit concentration of 1000 mg/kg diet for avian reproduction studies.

Parameter	Details	Remarks *Criteria*
		The highest test concentrations should show a significant effect or be at or above the actual or expected field residue level. The source (i.e., maximum label rate in lb ai/A and ppm), label registration no., label date, and site should be cited]
Solvent/vehicle, if used type: amount:	N/A	*Recommended solvents include corn oil or other appropriate vehicle not more than 2% of diet by weight*
Was detailed description and nutrient analysis of the basal diet provided? (Yes/No)	Yes. The basal ration (three batches) contained 23.3-24.9% crude protein, 6.8-7.3% crude fat, and 2.7-3.5% crude fiber.	Offspring were fed basal ration without the addition of test substance. *A commercial breeder feed or an equivalent that is appropriate for the test species is recommended.*
Preparation of test diet	Two days prior to study initiation, the appropriate amount of test substance was mixed with diet in a beaker. Thereafter, each premix was adjusted to the desired concentration with the appropriate amount of feed and mixed for about 10 minutes in a laboratory mixer. Treated feed was prepared every week during the study, and was stored at ambient temperature.	*A premixed diet containing the test substance should be mechanically mixed with basal diet. If an evaporative vehicle is used, it should be completely evaporated prior to feeding.*
Indicate whether stability and homogeneity of test material in diet determined (Yes/No)	Yes	
Were concentrations in diet verified by chemical analysis?	Yes	

Parameter	Details	Remarks *Criteria*
Did chemical analysis confirm that diet was stable?	Yes.	Stability was assessed in treated feed prepared at all treatment levels after 9 days of ambient storage (including 7 days in open feeders) during Week 1 (batch test diets were prepared 2 days prior to test initiation). Recoveries averaged 90.2-92.1% of nominal concentrations.
and homogeneous?	Yes	Homogeneity was assessed in freshly-prepared treated feed at the 100 and 1000 mg/kg diet levels on Day -2. One sample was collected from the upper, middle, and lower layer of each level. Reviewer-calculated coefficients of variation (CV=RSD) were 0.4 and 0.14%, respectively.
Feeding and husbandry	Feeding and husbandry conditions appeared to be adequate, given guideline recommendations.	
<u>Test conditions (pre-laying)</u> temperature: relative humidity: photoperiod:	Room 1: 20.7 ± 0.6°C (19.0-24.6°C) and 53 ± 9% (39-82%) Room 2: 20.5 ± 0.3°C (17.6-22.7 °C) and 51 ± 9% (26-88%) 7 hr light/day up through Week 7; 14 hr light/day during Weeks 8 and 9; and 17 hr light/day thereafter.	Temperature and humidity were for the adult room during the entire study. The air handling system provided *ca.* 15 room air volumes every hour. Light intensity was approximately 138-340 Lux. *Recommended temperature: about 21°C (70°F)* *Recommended relative humidity: about 55%* *Recommended lighting* *First 8 weeks: 7 h per day.* *Thereafter: 16-17 h per day.* *At least 6 foot-candles are recommended at bird level.*

Parameter	Details	Remarks *Criteria*
Egg Collection and Incubation		
Egg collection and storage collection interval: storage temperature: storage humidity:	Daily *Ca.* 16 ± 1°C *Ca.* 60-90%	*Eggs should be collected daily; recommended egg storage temperature is approximately 16°C (61°F); recommended humidity is approximately 65%.* *Recommended collection interval: daily*
Were eggs candled for cracks prior to setting for incubation?	Yes	*Eggs should be candled on day 0*
Were eggs set weekly?	Yes	
When candling was done for fertility?	Eggs were candled again on Days 14 (embryo viability) and 21 (embryo survival).	*Quail: approx. day 11* *Ducks: approx. day 14*
When the eggs were transferred to the hatcher?	Day 23	*Bobwhite: usually day 21* *Mallard: usually day 23*
Hatching conditions temperature: humidity: photoperiod:	*Ca.* 37.6-38.1°C *Ca.* 80-90% 17 hr light/day (hatchlings)	An area with a higher temperature (40 ± 2°C) was maintained by ceramic radiant heaters above the hatchling cages. *Recommended temperature is 39°C (102°F)* *Recommended humidity is 70%*
Day the hatched eggs were removed and counted	Days 27 or 28, within approximately 24 hours of hatching	*Eggs for bobwhite should be removed on day 24; for mallard on day 27*
Were egg shells washed and dried for at least 48 hrs before measuring?	Yes	

Parameter	Details	Remarks *Criteria*
Egg shell thickness no. of eggs used: intervals: mode of measurement:	One egg of each pair that laid at least one egg. Weeks 1, 3, 5, 7, and 9 of the egg production period. Four points around the girth of the shell using a micrometer graduated to 0.01 mm.	*Newly hatched eggs should be collected at least once every two weeks. Thickness of the shell plus membrane should be measured to the nearest 0.01 mm* with 3 - *4 measurements per shell.*
Reference chemical, if used	None used	

2. Observations:

Table 3: Observations.

Parameter	Details	Remarks
Parameters measured		
Parental (mortality, body weight, mean feed consumption)	- mortality - body weight - food consumption - signs of toxicity - palatability - necropsy	Extra birds which were sacrificed at the end of the pre-egg laying period and those which were terminated because the pen-mate had died were not examined post-mortem.
Egg collection and subsequent development (no. of eggs laid, no. of eggs cracked, shell thickness, no. of eggs set, no. of viable embryos, no. of live 3 week embryos, no. hatched, no. of 14-day survivors, average weight of 14-d old survivors, mortality, gross pathology, others)	- eggs laid - eggs cracked - egg weight - egg shell thickness - eggs set - viable embryos - live 3-week embryos - chicks dead in shell - number of hatchlings - hatchling abnormalities - hatchling body weight - number of 14-day-old survivors - 14-day-old survivor body weight - signs of toxicity of hatchlings	*Recommended endpoints measured include:* • *Eggs laid/pen* • *Eggs cracked/pen* • *Eggs set/pen* • *Viable embryos/pen* • *Live 3-week embryos/pen* • *Normal hatchlings/pen* • *14-day-old survivors/pen* • *14-day-old survivors/pen* • *Weights of 14-day-old* • *survivors (mean per pen)* • *Egg shell thickness* • *Food consumption (mean per pen)* • *Initial and final body weight (mean per pen)*

Parameter	Details	Remarks
Indicate if the test material was regurgitated	No indications of dietary regurgitation.	
Observation intervals (for various parameters)	Parental and hatchling mortality and signs of toxicity were recorded once daily. Parental body weights were recorded at weeks 0, 2, 4, 6, 8, and 20 (adult termination). Parental food consumption was measured weekly throughout the test.	*Body weights and food consumption should be measured at least biweekly*
Were raw data included?	Yes, sufficient.	Individual body weight data were not reported.

II. RESULTS AND DISCUSSION:

A. MORTALITY:

There was no mortality that could be attributed to the test substance. Two incidental mortalities occurred during the study: one in the control group and one in the 1000 mg a.i./kg diet group.

One control female was found dead during Week 18. Histopathological examination revealed numerous abnormalities, including lymphoplasmahistiocytic pancreatitiv, necrotizing spleenitis with granulomas and bacteri (spleen), multifocal to coalescing pyogranulomatous hepatits (liver), mild diffuse lymphoplasma cellular-infiltration of the intestine, acute diffuse congestion of the lungs, subacute to chronic focally extensive pyogranulomatous myocarditis and fibriosis (heart), and acute diffuse congestion of the kidneys.

On female from the 1000 mg a.i./kg diet level was found dead during Week 8 without having exhibited any prior clinical signs. Necropsy revealed yellow foci of the liver, bloody contents in the stomach, and dark red-colored contents of the intestines.

No other mortalities were observed during the study, and both deaths were considered incidental to treatment. The NOAEC for adult mortality was 1000 mg a.i./kg diet.

Table 4: Effect of BAS 800 H (Saflufenacil) on Mortality of Northern Bobwhite.

Treatment (mg a.i./kg diet) Mean-measured (and Nominal) Concentrations	Observation Period					
	Week 7		Week 14		Week 20	
	No. Dead		No. Dead		No. Dead	
	Male	Female	Male	Female	Male	Female
Control	0	0	0	0	0	1
95.0 (100)	0	0	0	0	0	0
279 (300)	0	0	0	0	0	0
940 (1000)	0	0	0	1	0	1

B. REPRODUCTIVE AND OTHER ENDPOINTS:

Abnormal Effects/Behavior: No abnormalities in appearance and behavior were observed in any of the treatment groups over the course of the study. The NOAEC for clinical signs of toxicity was 1000 mg a.i./kg diet.

Food Consumption: No rejection of food containing the test substance was observed, and no apparent treatment-related effects on feed consumption were evident at any concentration level tested. Statistical evaluation revealed a statistically-significant increase at the 300 mg a.i./kg diet level compared to the control during Week 7 (107.1 versus 86.3 g/bird/day; $p \leq 0.05$). Since the mean values for all groups were within a narrow range and no dose-related trend was observed, the difference observed was considered incidental to treatment. The NOAEC for feed consumption was 1000 mg a.i./kg diet.

Overall mean feed consumption was 139.1, 152.1, 149.8, and 138.9 g/bird/day for the 0, 100, 300, and 1000 mg a.i./kg diet groups, respectively. The calculated mean uptake of test substance was 14.5, 41.8, and 130.5 mg a.i./bird/day for the 100, 300, and 1000 mg a.i./kg diet groups, respectively. The calculated daily dose was 12.8, 37.0, and 114.5 mg a.i./kg bw, respectively.

Body Weight: No apparent treatment-related effects on body weight were observed at any treatment level, with no statistically-significant differences from the controls observed at any interval. The NOAEC for adult body weight was 1000 mg a.i./kg diet.

Necropsy: There were no macroscopic findings upon necropsy of surviving birds.

Egg production and quality: No statistically-significant differences in overall egg production, overall egg weight, egg quality (broken or cracked eggs), or mean egg shell thicknesses were observed at any treatment level compared to the control.

Embryo survival: The number of fertile eggs totaled 704, 638, 705, and 721 for the control, 100, 300, and 1000 mg a.i./kg diet groups, respectively, and the corresponding overall fertility rates were 92.3, 85.0, 88.4, and 95.9%, respectively. No statistically-significant differences in fertility rates were observed.

For the control, 100, 300, and 1000 mg a.i./kg diet levels, the rates of viable 14-day embryos of eggs initially set

were 90.5, 82.9, 86.4, and 91.8%, respectively, with no statistically-significant differences from the control observed.

The rates of late embryonic deaths was calculated as a percentage of fertile eggs and averaged 0.2, 0.9, 0.5, and 1.5% for the control, 100, 300, and 1000 mg a.i./kg diet levels, respectively. The difference between the 1000-mg/kg level and control was statistically-significant ($p \leq 0.05$). The study author reported that the absolute number of late embryonic deaths (i.e., 2, 4, 4, and 10 for the control, 100, 300, and 1000 mg a.i./kg diet levels, respectively) was low and well within the range of historical controls (0.5-4.6% in ten studies; mean of 1.9 ± 1.5%), while the rate of late embryonic mortalities in the control of this study was extraordinarily low and below the range of historical controls. It was concluded by the study author that the difference of 1.3% mortality between the control and 1000 mg a.i./kg diet level was without any relevance for the overall reproduction rate, and the statistical difference was considered to be incidental to treatment. The rates of live 21-day embryos of viable 14-day embryos were 99.8, 99.1, 99.5, and 98.5% at the control, 100, 300, and 1000 mg a.i./kg diet levels, respectively; a statistically-significant difference was observed at the 1000 mg a.i./kg diet level compared to the control ($p \leq 0.05$). The study author reported that this difference corresponds to the increase of late embryonic mortality previously discussed and was considered to be incidental to treatment.

The rates of "dead-in-shell" of fertile eggs were 9.7, 19.5, 15.2, and 15.0% for the control, 100, 300, and 1000 mg a.i./kg diet levels, respectively. Although the difference between the 100 mg a.i./kg diet level and control performance was statistically-significant ($p \leq 0.05$), the rate of "dead-in-shell" of fertile eggs in the control group was extremely low, and no dose-response was observed.

Hatching and hatchlings: The proportion of hatched chicks of live 21-day embryos was 90.0, 79.8, 84.4, and 84.0% for the control, 100, 300, and 1000 mg a.i./kg diet levels, respectively. Although the difference between the 100 mg a.i./kg diet level and control performance was statistically-significant ($p \leq 0.05$), the performance of the control group was considered extraordinarily high (conversely, the proportion of chicks "dead-in-shell" in the control group was extraordinarily low), and no dose-response was observed.

No clinical signs of toxicity or significant malformations exceeding the normal proportion were observed at any treatment level.

The proportion of 14-day survivors to number of hatchlings were 94.1, 98.6, 98.9, and 96.6% for the control, 100, 300, and 1000 mg a.i./kg diet levels, respectively. No statistically-significant differences to the control were observed over the whole egg-laying period for any level. In addition, there were no overall statistically-significant differences compared to the control in the mean numbers of 14-day surviving chicks per female and week.

No statistically-significant differences compared to the controls were observed in the mean hatchlings' or 14-day survivors' body weights over the whole egg-laying period.

Overall, there were no biologically-significant treatment-related effects on the reproductive parameters in any treatment level; the NOAEC for all applicable endpoints was 1000 mg a.i./kg.

Table 5: Reproductive and Other Parameters (nominal concentrations; study author-reported).

Parameter	Control	100 mg a.i./kg	300 mg a.i./kg	1000 mg a.i./kg	NOAEC/ LOAEC
Eggs laid	875	836	840	864	N/A
Eggs laid/hen/week	5.1	4.8	4.8	4.9	1000 mg a.i./kg >1000 mg a.i./kg
Eggs cracked	36	25	15	39	N/A
Egg weight (g)	59.7	60.8	61.7	61.6	1000 mg a.i./kg >1000 mg a.i./kg
Eggs set	770	740	756	751	N/A
Shell thickness (mm)	0.37	0.38	0.39	0.39	1000 mg a.i./kg >1000 mg a.i./kg
Viable embryos	688	624	686	686	N/A
Live 3-week embryos	686	620	682	676	N/A
No. of hatchlings/hen/week	3.5	2.9	3.2	3.2	1000 mg a.i./kg >1000 mg a.i./kg
No. of hatchlings	609	512	568	570	N/A
Hatchling weight (g)	35.1	35.3	36.0	36.4	1000 mg a.i./kg >1000 mg a.i./kg
14-day old survivors	593	504	561	552	N/A
14-day old survivors/hen/week	3.4	2.9	3.2	3.1	1000 mg a.i./kg >1000 mg a.i./kg
14-day old survivors weight (g)	283.3	280.7	291.6	286.0	1000 mg a.i./kg >1000 mg a.i./kg
Mean food consumption (g/bird/day)	139.1	152.1	149.8	138.9	1000 mg a.i./kg >1000 mg a.i./kg
Weight (g) of parent females at test initiation:	1081.8	1075.6	1066.3	1084.6	1000 mg a.i./kg

Parameter	Control	100 mg a.i./kg	300 mg a.i./kg	1000 mg a.i./kg	NOAEC/ LOAEC
at onset of egg laying: at test termination:	1053.2 1119.9	1070.5 1115.9	1073.8 1148.4	1084.9 1106.3	>1000 mg a.i./kg
Weight (g) of parent males at test initiation: at onset of egg laying: at test termination:	 1136.3 1214.3 1198.1	 1111.8 1188.6 1239.4	 1106.6 1205.4 1199.5	 1112.0 1177.1 1254.3	 1000 mg a.i./kg >1000 mg a.i./kg
Gross pathology	No treatment-related abnormalities observed.				

N/A = Not statistically-analyzed.

C. REPORTED STATISTICS:

The following variables were statistically analyzed: adult body weight, adult feed consumption, eggs laid per female, proportion of eggs damaged of egg laid, egg weight, egg shell thickness, proportion of fertile eggs of eggs initially set, proportion of viable 14-day embryos of egg initially set per female, proportion of early embryonic deaths on day 14 of fertile eggs per female, proportion of late embryonic deaths on day 21 of fertile eggs per female, proportion of viable 21-day embryos of eggs initially set per female, proportion of viable 21-day embryos of fertile eggs per female, proportion of viable 21-day embryos of viable 14-day embryos per female, proportion of "dead-in-shell" of fertile eggs per female, hatched chicks per female, proportion of normal hatchlings of eggs set per female, proportion of normal hatchlings of fertile eggs per female, proportion of normal hatchlings of viable 21-day embryos per female, 14-day old survivors per female, proportion of 14-day old survivors of eggs set, proportion of 14-day old survivors of fertile eggs per female, proportion of 14-day old survivors of normal hatchlings per female, means for hatched chicks' body weight at day 0, and means for 14-day surviving chicks' body weight.

For the body weight and food consumption of parent birds, for the egg weight, egg shell thickness, and chicks' body weight, a comparison of each dose group with the control group was performed using a two-sided Dunnett's test for the hypothesis of equal means. For count data (e.g., no of eggs, no. of hatched chicks) and proportions (e.g., no. of fertile eggs of initially set), a nonparametric analysis was carried out. A pairwise comparison of each dose group with the control was performed via the one-sided Wilcoxon test for the hypothesis of equal medians.

Sample units were the individual pens within each experimental group, except adult body weights, where the sample unit was the individual bird. If proportions were analyzed, sums of each pen were used in the numerator and in the denominator. The statistical analyses were performed using the SAS-System. For the analysis of the body weight and of the food consumption of parent birds, the DATATOX F1-System was used. Nominal concentrations were used for all estimations.

D. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: Analysis was conducted using "chicks.sas" (Ver. 3; March 2002), a SAS program provided by EFED/OPP/USEPA. Data for all endpoints were examined graphically using box plots to determine if they exhibited a dose-dependent response, which was ultimately used to select the multiple comparison test to detect

LOAEC and NOAEC. Data for each endpoint were tested to determine if their distributions were normal and if their variances were homogeneous using Shapiro-Wilk's and Levene's tests, respectively. Data that satisfied these assumptions were subjected to Dunnett's and William's tests and data that did not satisfy these assumptions were subjected to the non-parametric MannWhitney-U (with a Bonferroni adjustment) and Jonckheere's tests. Data for dead birds were excluded from the analyses. See Appendix I for output of reviewer's statistical verification and graphs for affected endpoints to support any reviewer-generated conclusions that may differ from those reported in the study.

NOAEC: 279 mg a.i./kg
LOAEC: 940 mg a.i./kg
Most Sensitive Endpoint(s): proportion of live 3-week embryos to viable embryos

Table 6: Reproductive and Other Parameters (mean-measured concentrations; reviewer-reported).

Parameter	Control	95.0 mg a.i./kg	279 mg a.i./kg	940 mg a.i./kg	NOAEC/ LOAEC
Eggs laid/pen	54.7	52.2	52.5	54.0	940 mg a.i./kg >940 mg a.i./kg
Eggs cracked/pen	2.2	1.6	0.9	2.4	940 mg a.i./kg >940 mg a.i./kg
Eggs not cracked/eggs laid (%)	96.3	97.4	97.0	95.0	940 mg a.i./kg >940 mg a.i./kg
Eggs set/pen	48.1	46.2	47.6	46.9	940 mg a.i./kg >940 mg a.i./kg
Shell thickness	0.38	0.38	0.39	0.39	940 mg a.i./kg >940 mg a.i./kg
Eggs set/eggs laid (%)	86.5	88.5	87.7	86.1	940 mg a.i./kg >940 mg a.i./kg
Viable embryos/pen	44.0	39.9	44.1	45.1	940 mg a.i./kg >940 mg a.i./kg
Viable embryos/eggs set (%)	92.3	85.0	87.5	95.9	940 mg a.i./kg >940 mg a.i./kg
Live embryos/pen	42.9	38.8	42.6	42.2	940 mg a.i./kg >940 mg a.i./kg
Live embryos/viable embryos (%)	97.8	96.8	97.3	94.4**	**279 mg a.i./kg 940 mg a.i./kg**
No. of hatchlings/pen	38.1	32.0	35.5	35.6	940 mg a.i./kg >940 mg a.i./kg
No. of hatchlings/eggs laid (%)	69.8	58.5	66.1	65.2	940 mg a.i./kg >940 mg a.i./kg
No. of hatchlings/eggs set (%)	80.9	66.2	72.2	75.9	940 mg a.i./kg >940 mg a.i./kg
No. of hatchlings/live embryos (%)	90.0	79.8	84.4	84.0	940 mg a.i./kg >940 mg a.i./kg
Hatchling survival/pen	37.1	31.5	35.1	34.5	940 mg a.i./kg >940 mg a.i./kg
Hatchling survival/eggs set (%)	75.6	65.3	71.4	73.5	940 mg a.i./kg >940 mg a.i./kg

Hatchling survival/no. of hatchlings (%)	94.1	98.6	98.9	96.6	940 mg a.i./kg >940 mg a.i./kg
Hatchling weight (g)	35.0	34.8	36.1	36.3	940 mg a.i./kg >940 mg a.i./kg
Survivor weight (g)	281.5	280.0	290.6	287.2	940 mg a.i./kg >940 mg a.i./kg
Mean food consumption (g/bird/day)	138.3	152.3	148.6	136.8	940 mg a.i./kg >940 mg a.i./kg
Male weight gain (g)	73.6	145.1	112.1	101.7	940 mg a.i./kg >940 mg a.i./kg
Female weight gain (g)	48.0	41.1	70.6	11.6	940 mg a.i./kg >940 mg a.i./kg

** Statistically different from the control at p=0.01.

E. STUDY DEFICIENCIES:

There were no significant deviations from U.S. EPA OPPTS Guideline No. 850.2300 affecting the scientific soundness or acceptability of this study.

F. REVIEWER'S COMMENTS:

Results of the reviewer's statistical verification were similar to the study author's; however, the conclusions differed. The reviewer determined the NOAEC to be 279 mg a.i./kg based on the slight (3%), but statistically significant (p=0.01) reduction in the proportion of live 3-week embryos to viable embryos at the 940 mg a.i./kg treatment level. The study author's analysis also detected this effect, but dismissed it as being treatment related and attributed it to "extraordinarily low" embryo mortality in the control group (0.0-0.6), relative to "historical" levels exhibited in the highest treatment group (1.1-1.6). Historical data were provided in Table 25 (page 77 of 343) of the study report showing that the proportion of late embryonic mortality of fertile eggs from historical controls ranged from 0.5-4.6 in studies over a 15 year period. According to these data, the reviewer disagrees that the control embryo mortality in this study (0.0-0.6) was "extraordinarily low", and believes that the control data provide an acceptable comparison to the treatment data. Therefore, the reduction in live embryos to viable embryos at the highest treatment level cannot be disregarded as unrelated to treatment, despite the low magnitude effect. Mean-measured concentrations and daily doses are reported by the reviewer in the Executive Summary and Conclusions sections of the DER.

All validity requirements were met. Specifically, controls produced an average of 37 14-day old survivors per hen during the 12-week production phase (minimum of 10 ducklings per pen during a 10-week production phase), the egg shell thickness of control eggs was 0.37 mm (minimum of 0.34 mm for ducks), and 3% adult control mortality was observed during the study (no more than 10% acceptable in controls).

Occasionally, eggs were produced during the last part of the egg-laying period (Weeks 6-8). With exception of two pairs, pairs with an early onset of egg-laying were removed from the study at the end of Week 10. The eggs laid before Week 10 were not considered for the valuation of reproduction parameters.

Ten-gram portions of treated-diet samples were combined with 20 mL of double-distilled water and allowed to sit for 20 minutes at ambient temperature. The samples were then extracted twice with 35 mL of acetonitrile by shaking 30 minutes at ambient temperature and subsequent sonification (5 minutes). The extracts were combined, filtered, and diluted with acetonitrile (to 100 mL) prior to analysis by HPLC with UV (270 nm) detection. The analytical LOQ was 1.00 mg/L, corresponding to 10.0 mg/kg feed.

In method validation assessments, the average recoveries of the test substance were 100.1 ± 1.9% and 84.7 ± 4.6% in fortified feed samples containing 500 and 5000 mg/kg BAS 800 H, respectively.

In-life dates were February 15 – August 16, 2006.

G. CONCLUSIONS:

This study is scientifically sound and is classified as ACCEPTABLE to U.S. EPA and as FULLY RELIABLE to PMRA and APVMA. A significant (p=0.01), but slight (3%) reduction was detected for the proportion of live 3-week embryos to viable embryos at the highest treatment level. No other biologically-significant treatment-related effects were observed on any adult or offspring parameter at any concentration level. Based on these results, the NOAEC and LOAEC were 279 and 940 mg a.i./kg (37 and 114.5 mg a.i./kg bw, respectively).

NOAEC: 279 mg a.i./kg (37 mg a.i./kg bw)
LOAEC: 940 mg a.i./kg (114.5 mg a.i./kg bw)
Most Sensitive Endpoint(s): proportion of live 3-week embryos to viable embryos

III. REFERENCES:

A reference list was not provided.

APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

Mallard repro, Saflufenacil, MRID 471279-16
PRINTOUT OF RAW DATA

Obs	TRT	EL	EC	ENC_EL	ES	ES_EL	VE	VE_ES	LE	LE_VE	NH	NH_EL	NH_ES
1	Ctrl	62	2	96.77	55	88.71	54	98.18	50	92.59	45	72.58	81.82
2	Ctrl	69	2	97.10	62	89.86	54	87.10	50	92.59	46	66.67	74.19
3	Ctrl	70	2	97.14	63	90.00	60	95.24	59	98.33	58	82.86	92.06
4	Ctrl	71	0	100.00	66	92.96	63	95.45	59	93.65	46	64.79	69.70
5	Ctrl	50	0	100.00	46	92.00	44	95.65	44	100.00	32	64.00	69.57
6	Ctrl	45	0	100.00	40	88.89	38	95.00	37	97.37	34	75.56	85.00
7	Ctrl	75	2	97.33	68	90.67	67	98.53	66	98.51	55	73.33	80.88
8	Ctrl	0	0	.	0	.	0	.	0	.	0	.	.
9	Ctrl	61	4	93.44	52	85.25	52	100.00	51	98.08	37	60.66	71.15
10	Ctrl	71	17	76.06	49	69.01	35	71.43	35	100.00	34	47.89	69.39
11	Ctrl	41	2	95.12	34	82.93	33	97.06	33	100.00	31	75.61	91.18
12	Ctrl	3	0	100.00	2	66.67	2	100.00	2	100.00	2	66.67	100.00
13	Ctrl	74	1	98.65	68	91.89	66	97.06	66	100.00	62	83.78	91.18
14	Ctrl	64	0	100.00	59	92.19	57	96.61	56	98.25	51	79.69	86.44
15	Ctrl	71	1	98.59	65	91.55	39	60.00	38	97.44	38	53.52	58.46
16	Ctrl	.	.	.	.	.	.	.	.	.	.	.	.
17	Ctrl	.	.	.	.	.	.	.	.	.	.	.	.
18	Ctrl	48	3	93.75	41	85.42	40	97.56	40	100.00	38	79.17	92.68
19	Dose1	60	2	96.67	53	88.33	53	100.00	53	100.00	53	88.33	100.00
20	Dose1	72	7	90.28	60	83.33	60	100.00	58	96.67	54	75.00	90.00
21	Dose1	57	0	100.00	52	91.23	38	73.08	37	97.37	28	49.12	53.85
22	Dose1	36	0	100.00	32	88.89	31	96.88	30	96.77	17	47.22	53.13
23	Dose1	71	1	98.59	65	91.55	64	98.46	64	100.00	56	78.87	86.15
24	Dose1	.	.	.	.	.	.	.	.	.	.	.	.
25	Dose1	65	1	98.46	59	90.77	33	55.93	32	96.97	28	43.08	47.46
26	Dose1	39	1	97.44	34	87.18	21	61.76	20	95.24	14	35.90	41.18
27	Dose1	61	2	96.72	54	88.52	40	74.07	38	95.00	24	39.34	44.44
28	Dose1	69	2	97.10	62	89.86	61	98.39	60	98.36	56	81.16	90.32
29	Dose1	29	0	100.00	26	89.66	26	100.00	22	84.62	19	65.52	73.08
30	Dose1	52	1	98.08	47	90.38	45	95.74	45	100.00	43	82.69	91.49
31	Dose1	25	0	100.00	22	88.00	21	95.45	21	100.00	17	68.00	77.27
32	Dose1	53	7	86.79	41	77.36	41	100.00	39	95.12	33	62.26	80.49
33	Dose1	36	0	100.00	32	88.89	4	12.50	4	100.00	3	8.33	9.38
34	Dose1	70	1	98.57	64	91.43	64	100.00	63	98.44	52	74.29	81.25
35	Dose1	41	0	100.00	37	90.24	36	97.30	34	94.44	15	36.59	40.54
36	Dose1	.	.	.	.	.	.	.	.	.	.	.	.
37	Dose2	57	0	100.00	52	91.23	51	98.08	50	98.04	43	75.44	82.69
38	Dose2	56	2	96.43	49	87.50	48	97.96	47	97.92	42	75.00	85.71
39	Dose2	72	4	94.44	63	87.50	63	100.00	59	93.65	52	72.22	82.54
40	Dose2	66	0	100.00	61	92.42	57	93.44	54	94.74	51	77.27	83.61
41	Dose2	46	1	97.83	40	86.96	39	97.50	38	97.44	36	78.26	90.00
42	Dose2	51	0	100.00	46	90.20	45	97.83	44	97.78	36	70.59	78.26
43	Dose2	74	0	100.00	69	93.24	69	100.00	67	97.10	57	77.03	82.61
44	Dose2	66	3	95.45	58	87.88	53	91.38	51	96.23	44	66.67	75.86
45	Dose2	67	2	97.01	60	89.55	55	91.67	52	94.55	39	58.21	65.00
46	Dose2	71	0	100.00	66	92.96	65	98.48	62	95.38	51	71.83	77.27
47	Dose2	67	0	100.00	62	92.54	39	62.90	39	100.00	30	44.78	48.39
48	Dose2	36	0	100.00	32	88.89	31	96.88	31	100.00	30	83.33	93.75

49	Dose2	.	.	.	.	.	.	.	.	.	.	.
50	Dose2	1	0	100.00	1	100.00	1	100.00	1	100.00	1	100.00	100.00
51	Dose2	69	1	98.55	63	91.30	56	88.89	54	96.43	35	50.72	55.56
52	Dose2	4	1	75.00	1	25.00	0	0.00	0	.	0	0.00	0.00
53	Dose2	.	.	.	.	.	.	.	.	.	.	.	.
54	Dose2	37	1	97.30	39	105.41	33	84.62	33	100.00	21	56.76	53.85
55	Dose3	40	2	95.00	34	85.00	32	94.12	32	100.00	30	75.00	88.24
56	Dose3	51	0	100.00	46	90.20	45	97.83	44	97.78	40	78.43	86.96
57	Dose3	65	6	90.77	54	83.08	54	100.00	53	98.15	51	78.46	94.44
58	Dose3	32	9	71.88	19	59.38	19	100.00	19	100.00	17	53.13	89.47
59	Dose3	67	0	100.00	62	92.54	61	98.39	55	90.16	53	79.10	85.48
60	Dose3	66	2	96.97	59	89.39	59	100.00	55	93.22	49	74.24	83.05
61	Dose3	71	3	95.77	63	88.73	63	100.00	57	90.48	29	40.85	46.03
62	Dose3	.	.	.	.	.	.	.	.	.	.	.	.
63	Dose3	.	.	.	.	.	.	.	.	.	.	.	.
64	Dose3	50	7	86.00	38	76.00	27	71.05	27	100.00	23	46.00	60.53
65	Dose3	55	0	100.00	50	90.91	50	100.00	49	98.00	37	67.27	74.00
66	Dose3	57	5	91.23	47	82.46	47	100.00	40	85.11	36	63.16	76.60
67	Dose3	66	3	95.45	58	87.88	57	98.28	50	87.72	46	69.70	79.31
68	Dose3	57	1	98.25	51	89.47	51	100.00	47	92.16	41	71.93	80.39
69	Dose3	48	1	97.92	43	89.58	38	88.37	37	97.37	24	50.00	55.81
70	Dose3	69	0	100.00	64	92.75	55	85.94	53	96.36	52	75.36	81.25
71	Dose3	34	0	100.00	31	91.18	31	100.00	29	93.55	20	58.82	64.52
72	Dose3	36	0	100.00	32	88.89	32	100.00	29	90.63	22	61.11	68.75

Mallard repro, Saflufenacil, MRID 471279-16
PRINTOUT OF RAW DATA (continued)

Obs	TRT	NH_LE	HS	HS_ES	HS_NH	THICK	HATWT	SURVWT	FOOD	WTGAINM	WTGAINF
1	Ctrl	90.00	43	78.18	95.56	0.37	37	276	111	138	-6
2	Ctrl	92.00	46	74.19	100.00	0.40	36	316	138	53	58
3	Ctrl	98.31	58	92.06	100.00	0.42	35	280	137	43	44
4	Ctrl	77.97	45	68.18	97.83	0.37	36	287	134	125	212
5	Ctrl	72.73	29	63.04	90.63	0.41	33	269	115	4	.
6	Ctrl	91.89	32	80.00	94.12	0.38	39	302	142	-16	95
7	Ctrl	83.33	54	79.41	98.18	0.39	33	304	125	42	29
8	Ctrl	.	0	.	.	.	.	.	173	10	151
9	Ctrl	72.55	35	67.31	94.59	0.38	32	276	116	105	132
10	Ctrl	97.14	34	69.39	100.00	0.40	31	302	174	38	-0
11	Ctrl	93.94	30	88.24	96.77	0.37	31	263	136	112	-75
12	Ctrl	100.00	1	50.00	50.00	0.29	43	206	119	102	57
13	Ctrl	93.94	61	89.71	98.39	0.35	30	275	138	193	-58
14	Ctrl	91.07	49	83.05	96.08	0.39	38	303	158	158	-29
15	Ctrl	100.00	38	58.46	100.00	0.37	36	240	168	-29	81
16	Ctrl	.	.	.	.	.	.	.	.	.	.
17	Ctrl	.	.	.	.	.	.	.	.	.	.
18	Ctrl	95.00	38	92.68	100.00	0.36	37	290	129	100	29
19	Dose1	100.00	52	98.11	98.11	0.38	36	301	125	-10	111
20	Dose1	93.10	53	88.33	98.15	0.35	35	264	132	116	110
21	Dose1	75.68	27	51.92	96.43	0.36	35	259	163	348	25
22	Dose1	56.67	16	50.00	94.12	0.41	31	267	124	204	-4
23	Dose1	87.50	56	86.15	100.00	0.39	34	301	206	256	39
24	Dose1	.	.	.	.	.	.	.	.	.	.
25	Dose1	87.50	28	47.46	100.00	0.40	34	288	197	62	54

26	Dose1	70.00	14	41.18	100.00	0.38	33	254	146	75	-5
27	Dose1	63.16	23	42.59	95.83	0.39	33	271	152	78	-16
28	Dose1	93.33	53	85.48	94.64	0.38	36	291	131	50	13
29	Dose1	86.36	19	73.08	100.00	0.38	33	235	128	121	14
30	Dose1	95.56	43	91.49	100.00	0.37	37	268	142	45	67
31	Dose1	80.95	17	77.27	100.00	0.37	35	299	156	269	16
32	Dose1	84.62	33	80.49	100.00	0.40	39	298	131	38	45
33	Dose1	75.00	3	9.38	100.00	0.39	34	274	174	268	133
34	Dose1	82.54	52	81.25	100.00	0.39	36	278	201	9	67
35	Dose1	44.12	15	40.54	100.00	0.41	35	333	131	392	-11
36	Dose1	.	.	.	.	.	.	.	.	.	.
37	Dose2	86.00	43	82.69	100.00	0.39	37	300	133	126	128
38	Dose2	89.36	42	85.71	100.00	0.39	33	283	136	173	103
39	Dose2	88.14	51	80.95	98.08	0.39	36	306	156	201	10
40	Dose2	94.44	51	83.61	100.00	0.39	34	271	154	7	159
41	Dose2	94.74	35	87.50	97.22	0.38	37	285	173	168	10
42	Dose2	81.82	36	78.26	100.00	0.40	35	289	205	233	29
43	Dose2	85.07	55	79.71	96.49	0.38	35	269	119	152	92
44	Dose2	86.27	43	74.14	97.73	0.39	34	301	200	223	107
45	Dose2	75.00	38	63.33	97.44	0.39	35	269	141	250	54
46	Dose2	82.26	51	77.27	100.00	0.39	38	287	137	30	38
47	Dose2	76.92	30	48.39	100.00	0.41	37	305	101	-117	115
48	Dose2	96.77	30	93.75	100.00	0.40	36	289	159	135	128
49	Dose2	.	.	.	.	.	.	.	.	.	.
50	Dose2	100.00	1	100.00	100.00	.	40	322	132	80	-28
51	Dose2	64.81	34	53.97	97.14	0.41	35	288	141	133	-62
52	Dose2	.	0	0.00	.	0.37	.	.	147	41	95
53	Dose2	.	.	.	.	.	.	.	.	.	.
54	Dose2	63.64	21	53.85	100.00	0.39	41	294	146	-41	152
55	Dose3	93.75	29	85.29	96.67	0.38	36	255	123	123	-163
56	Dose3	90.91	39	84.78	97.50	0.36	38	296	147	90	56
57	Dose3	96.23	49	90.74	96.08	0.38	36	289	138	52	103
58	Dose3	89.47	16	84.21	94.12	0.39	35	318	116	122	-52
59	Dose3	96.36	50	80.65	94.34	0.38	39	310	133	111	-139
60	Dose3	89.09	49	83.05	100.00	0.38	34	263	139	93	.
61	Dose3	50.88	28	44.44	96.55	0.39	36	293	179	137	71
62	Dose3	.	.	.	.	.	.	.	.	.	.
63	Dose3	.	.	.	.	.	.	.	102	.	.
64	Dose3	85.19	23	60.53	100.00	0.36	41	319	108	.	137
65	Dose3	75.51	35	70.00	94.59	0.41	36	281	157	-11	-64
66	Dose3	90.00	36	76.60	100.00	0.37	36	276	186	134	60
67	Dose3	92.00	46	79.31	100.00	0.40	34	302	135	-1	180
68	Dose3	87.23	39	76.47	95.12	0.41	41	309	139	166	134
69	Dose3	64.86	20	46.51	83.33	0.39	34	234	103	81	45
70	Dose3	98.11	51	79.69	98.08	0.41	36	284	145	47	-90
71	Dose3	68.97	20	64.52	100.00	0.42	33	285	133	219	-19
72	Dose3	75.86	22	68.75	100.00	0.38	36	284	143	164	-86

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Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE EL  ( Eggs Laid )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.867         <.001          1.347      0.268    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16    54.69    23.40       5.85       42.79          42.22,   67.16
  Dose1 16    52.25    15.86       3.96       30.35          43.80,   60.70
  Dose2 16    52.50    22.86       5.71       43.54          40.32,   64.68
  Dose3 16    54.00    13.10       3.28       24.27          47.02,   60.98

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        63.00     0.00      75.00         .                    .
  Dose1       55.00    25.00      72.00       95.54                4.46
  Dose2       61.50     1.00      74.00       96.00                4.00
  Dose3       56.00    32.00      71.00       98.74                1.26

*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                1.68       0.642

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      63.00                    .                       .
  Dose1     55.00                  0.423                   0.133
  Dose2     61.50                  0.981                   0.298
  Dose3     56.00                  0.461                   0.192

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE NEG_EC  ( Eggs Cracked )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.713         <.001          1.402      0.251    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16     2.25     4.12        1.03      183.25           0.05,    4.45
  Dose1 16     1.56     2.25        0.56      144.00           0.36,    2.76
  Dose2 16     0.94     1.24        0.31      131.90           0.28,    1.60
  Dose3 16     2.44     2.87        0.72      117.93           0.91,    3.97

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl         1.50     0.00      17.00          .                    .
  Dose1        1.00     0.00       7.00        69.44               30.56
  Dose2        0.50     0.00       4.00        41.67               58.33
  Dose3        1.50     0.00       9.00       108.33               -8.33

*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                 2.29       0.515

MannWhit(Bon) - testing each trt median signif. greater than control
Jonckheere - test assumes dose-response relationship, testing positive trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl       1.50                    .                      .
  Dose1      1.00                  1.000                  0.702
  Dose2      0.50                  1.000                  0.873
  Dose3      1.50                  1.000                  0.458

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE ENC_EL ((EL-EC)/EL (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.670	<.001	0.847	0.474	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	96.26	6.02	1.55	6.26	92.93, 99.60
Dose1	16	97.42	3.74	0.93	3.83	95.43, 99.41
Dose2	16	97.00	6.16	1.54	6.35	93.72, 100.00
Dose3	16	94.95	7.40	1.85	7.79	91.01, 98.90

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	97.33	76.06	100.00	.	.
Dose1	98.52	86.79	100.00	101.20	-1.20
Dose2	99.28	75.00	100.00	100.77	-0.77
Dose3	97.44	71.88	100.00	98.64	1.36

****

NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.50	0.681

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	97.33	.	.
Dose1	98.52	1.000	0.672
Dose2	99.28	1.000	0.760
Dose3	97.44	1.000	0.373

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE ES (Eggs Set)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.883	<.001	0.899	0.447	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	16	48.13	21.22	5.30	44.09	36.82, 59.43
Dose1	16	46.25	14.31	3.58	30.95	38.62, 53.88
Dose2	16	47.63	21.07	5.27	44.25	36.40, 58.85
Dose3	16	46.94	13.27	3.32	28.27	39.87, 54.01

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	53.50	0.00	68.00	.	.
Dose1	49.50	22.00	65.00	96.10	3.90
Dose2	55.00	1.00	69.00	98.96	1.04
Dose3	48.50	19.00	64.00	97.53	2.47

****

NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.61	0.658

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	53.50	.	.
Dose1	49.50	0.515	0.163
Dose2	55.00	1.000	0.414
Dose3	48.50	0.530	0.243

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE ES_EL (EggsSet/EggsLaid (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.594	<.001	1.128	0.345	USE NON-PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	86.53	8.13	2.10	9.39	82.03, 91.03
Dose1	16	88.48	3.59	0.90	4.06	86.56, 90.39
Dose2	16	87.66	17.39	4.35	19.84	78.39, 96.93
Dose3	16	86.09	8.34	2.09	9.69	81.65, 90.53

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	89.86	66.67	92.96	.	.
Dose1	89.27	77.36	91.55	102.25	-2.25
Dose2	90.71	25.00	105.41	101.30	-1.30
Dose3	89.14	59.38	92.75	99.49	0.51

****
NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	3.09	0.378

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	89.86	.	.
Dose1	89.27	1.000	0.361
Dose2	90.71	1.000	0.847
Dose3	89.14	0.876	0.403

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE VE  ( Viable Embryo(d14) )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.930         0.001          0.420      0.739    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16    44.00    20.07       5.02       45.61          33.31,   54.69
  Dose1 16    39.88    17.42       4.35       43.69          30.59,   49.16
  Dose2 16    44.06    20.22       5.06       45.89          33.29,   54.84
  Dose3 16    45.06    13.54       3.38       30.04          37.85,   52.28

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        48.00     0.00      67.00         .                  .
  Dose1       39.00     4.00      64.00        90.63               9.38
  Dose2       49.50     0.00      69.00       100.14              -0.14
  Dose3       48.50    19.00      63.00       102.41              -2.41

*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                1.16       0.762

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      48.00                    .                      .
  Dose1     39.00                  0.604                  0.193
  Dose2     49.50                  1.000                  0.500
  Dose3     48.50                  1.000                  0.493

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE VE_ES  ( ViableEmbryo/EggsSet (%) )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.661         <.001          3.014      0.037    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  15    92.32    11.42       2.95       12.37          86.00,   98.65
  Dose1 16    84.97    24.37       6.09       28.67          71.99,   97.96
  Dose2 16    87.48    25.09       6.27       28.68          74.11,  100.00
  Dose3 16    95.87     7.93       1.98        8.27          91.65,  100.00

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        96.61    60.00     100.00         .                    .
  Dose1       97.09    12.50     100.00       92.04                7.96
  Dose2       97.19     0.00     100.00       94.75                5.25
  Dose3      100.00    71.05     100.00      103.84               -3.84

*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                5.19       0.159

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      96.61                    .                      .
  Dose1     97.09                  1.000                  0.647
  Dose2     97.19                  1.000                  0.535
  Dose3    100.00                  1.000                  0.964

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE LE (Live Embryo(d21))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.933	0.002	0.531	0.662	USE NON-PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	16	42.88	19.43	4.86	45.33	32.52, 53.23
Dose1	16	38.75	17.50	4.37	45.16	29.43, 48.07
Dose2	16	42.63	19.22	4.81	45.09	32.38, 52.87
Dose3	16	42.25	12.02	3.00	28.45	35.85, 48.65

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	47.00	0.00	66.00	.	.
Dose1	37.50	4.00	64.00	90.38	9.62
Dose2	48.50	0.00	67.00	99.42	0.58
Dose3	45.50	19.00	57.00	98.54	1.46

****
NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.25	0.741

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	47.00	.	.
Dose1	37.50	0.574	0.183
Dose2	48.50	1.000	0.489
Dose3	45.50	0.753	0.380

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE LE_VE (LiveEmbryo/ViableEmbryo (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.932	0.002	3.858	0.014	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	97.79	2.70	0.70	2.76	96.29, 99.28
Dose1	16	96.81	3.82	0.96	3.95	94.78, 98.85
Dose2	15	97.28	2.13	0.55	2.19	96.10, 98.46
Dose3	16	94.42	4.70	1.17	4.97	91.91, 96.92

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	98.33	92.59	100.00	.	.
Dose1	97.17	84.62	100.00	99.00	1.00
Dose2	97.44	93.65	100.00	99.48	0.52
Dose3	94.96	85.11	100.00	96.55	3.45

****

NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	5.93	0.115

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	98.33	.	.
Dose1	97.17	0.672	0.215
Dose2	97.44	0.478	0.173
Dose3	94.96	0.045	0.010

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose2	Dose3
Jonckheere	**Dose2**	**Dose3**

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE NH (Number Hatched)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.957	0.025	0.735	0.535	USE PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	16	38.06	17.26	4.32	45.35	28.86, 47.26
Dose1	16	32.00	17.83	4.46	55.72	22.50, 41.50
Dose2	16	35.50	16.57	4.14	46.68	26.67, 44.33
Dose3	16	35.63	12.36	3.09	34.68	29.04, 42.21

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	38.00	0.00	62.00	.	.
Dose1	28.00	3.00	56.00	84.07	15.93
Dose2	37.50	0.00	57.00	93.27	6.73
Dose3	36.50	17.00	53.00	93.60	6.40

****
PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	60	0.38	0.766

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	38.06	.	38.06	.	0.714	0.970	0.974	.	.
Dose1	32.00	0.301	34.38	0.311	.	0.928	0.920	.	.
Dose2	35.50	0.565	34.38	0.333	.	.	1.000	.	.
Dose3	35.63	0.575	34.38	0.345	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE NH_EL (NumberHatched/EggsLaid (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.924	<.001	2.991	0.038	USE NON-PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	69.78	10.51	2.71	15.06	63.97, 75.60
Dose1	16	58.48	22.22	5.56	38.00	46.64, 70.32
Dose2	16	66.13	22.07	5.52	33.37	54.37, 77.89
Dose3	16	65.16	12.37	3.09	18.98	58.57, 71.75

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	72.58	47.89	83.78	.	.
Dose1	63.89	8.33	88.33	83.80	16.20
Dose2	72.03	0.00	100.00	94.77	5.23
Dose3	68.48	40.85	79.10	93.37	6.63

****
NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	2.48	0.478

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	72.58	.	.
Dose1	63.89	0.293	0.089
Dose2	72.03	1.000	0.389
Dose3	68.48	0.403	0.305

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE NH_ES (NumberHatched/EggsSet (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.918	<.001	4.042	0.011	USE NON-PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	80.91	11.70	3.02	14.46	74.43, 87.39
Dose1	16	66.25	25.29	6.32	38.17	52.78, 79.73
Dose2	16	72.19	24.10	6.03	33.39	59.35, 85.04
Dose3	16	75.93	13.47	3.37	17.74	68.75, 83.11

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	81.82	58.46	100.00	.	.
Dose1	75.17	9.38	100.00	81.88	18.12
Dose2	80.40	0.00	100.00	89.22	10.78
Dose3	79.85	46.03	94.44	93.84	6.16

****
NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	2.82	0.420

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	81.82	.	.
Dose1	75.17	0.186	0.055
Dose2	80.40	0.619	0.212
Dose3	79.85	0.482	0.297

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE NH_LE  ( NumberHatched/LiveEmbryo (%) )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.925         <.001          1.275      0.291    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  15    89.99     9.17       2.37       10.19          84.91,   95.07
  Dose1 16    79.76    15.13       3.78       18.96          71.70,   87.81
  Dose2 15    84.35    10.76       2.78       12.75          78.39,   90.31
  Dose3 16    84.03    13.27       3.32       15.79          76.96,   91.10

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        92.00    72.55     100.00         .                 .
  Dose1       83.58    44.12     100.00       88.63             11.37
  Dose2       86.00    63.64     100.00       93.73              6.27
  Dose3       89.28    50.88      98.11       93.37              6.63

*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                5.67       0.129

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      92.00                    .                      .
  Dose1     83.58                  0.070                  0.018
  Dose2     86.00                  0.203                  0.078
  Dose3     89.28                  0.180                  0.181

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE HS  ( Hatching Survival(d14) )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.957         0.025          0.740      0.532    USE PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16    37.06    17.22       4.31       46.47          27.89,   46.24
  Dose1 16    31.50    17.52       4.38       55.61          22.17,   40.83
  Dose2 16    35.06    16.30       4.07       46.47          26.38,   43.75
  Dose3 16    34.50    12.20       3.05       35.36          28.00,   41.00

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        38.00     0.00      61.00          .                   .
  Dose1       27.50     3.00      56.00        84.99               15.01
  Dose2       37.00     0.00      55.00        94.60                5.40
  Dose3       35.50    16.00      51.00        93.09                6.91

*****************************************************************************
PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Analysis of Variance (ANOVA) - overall F-test
     Numerator df    Denominator df    F-stat       P-value
           3           60               0.33        0.802

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level    Mean   Dunnett  Isotonic  Williams                Tukey p-values
                p-value    mean     p-value   Dose1   Dose2   Dose3   Dose4   Dose5

 Ctrl    37.06    .        37.06      .       0.758   0.985   0.969    .       .
 Dose1   31.50   0.330     33.69     0.329     .      0.921   0.951    .       .
 Dose2   35.06   0.607     33.69     0.352     .       .      1.000    .       .
 Dose3   34.50   0.563     33.69     0.365     .       .       .       .       .

 SUMMARY                    NOEC            LOEC
   Dunnett                   Dose3           >highest dose
   Williams                  Dose3           >highest dose
```

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE HS_ES (HatchingSurvival/EggsSet (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.919	<.001	3.798	0.015	USE NON-PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval	
Ctrl	15	75.59	12.79	3.30	16.91	68.51,	82.67
Dose1	16	65.30	25.03	6.26	38.33	51.96,	78.63
Dose2	16	71.45	23.96	5.99	33.54	58.68,	84.21
Dose3	16	73.47	13.58	3.40	18.49	66.23,	80.71

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	78.18	50.00	92.68	.	.
Dose1	75.17	9.38	98.11	86.38	13.62
Dose2	78.99	0.00	100.00	94.51	5.49
Dose3	77.95	44.44	90.74	97.19	2.81

****

NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	0.89	0.827

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	78.18	.	.
Dose1	75.17	0.556	0.176
Dose2	78.99	1.000	0.461
Dose3	77.95	1.000	0.449

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE HS_NH  ( HatchingSurvival/NumberHatched (%) )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.492         <.001          2.639      0.058    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  15    94.14    12.52       3.23       13.30          87.21,  100.00
  Dose1 16    98.58     2.13       0.53        2.16          97.44,   99.72
  Dose2 15    98.94     1.38       0.36        1.40          98.17,   99.71
  Dose3 16    96.65     4.21       1.05        4.36          94.40,   98.89

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        97.83    50.00     100.00         .                  .
  Dose1      100.00    94.12     100.00      104.71             -4.71
  Dose2      100.00    96.49     100.00      105.10             -5.10
  Dose3       97.08    83.33     100.00      102.66             -2.66

*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                6.11       0.107

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      97.83                    .                      .
  Dose1    100.00                  1.000                  0.947
  Dose2    100.00                  1.000                  0.965
  Dose3     97.08                  1.000                  0.505

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE THICK (Eggshell thickness)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.919	<.001	2.621	0.059	USE NON-PARAMETRIC TESTS

****
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	0.38	0.03	0.01	8.13	0.36, 0.39
Dose1	16	0.38	0.02	0.00	4.35	0.38, 0.39
Dose2	15	0.39	0.01	0.00	2.71	0.39, 0.40
Dose3	16	0.39	0.02	0.00	4.63	0.38, 0.40

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	0.38	0.29	0.42	.	.
Dose1	0.39	0.35	0.41	102.05	-2.05
Dose2	0.39	0.37	0.41	103.89	-3.89
Dose3	0.39	0.36	0.42	103.04	-3.04

****
NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	3.41	0.332

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	0.38	.	.
Dose1	0.39	1.000	0.752
Dose2	0.39	1.000	0.964
Dose3	0.39	1.000	0.915

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE HATWT (Hatchling Weight)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.969	0.114	2.241	0.093	USE PARAMETRIC TESTS

****

BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	35.05	3.55	0.92	10.12	33.08, 37.01
Dose1	16	34.83	1.87	0.47	5.36	33.83, 35.82
Dose2	15	36.11	2.07	0.53	5.74	34.97, 37.26
Dose3	16	36.27	2.44	0.61	6.74	34.97, 37.57

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	35.50	29.90	43.30	.	.
Dose1	35.30	31.30	39.20	99.37	0.63
Dose2	36.10	32.90	40.50	103.04	-3.04
Dose3	35.95	32.70	41.40	103.49	-3.49

****

PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	58	1.29	0.287

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	35.05	.	35.56	.	0.995	0.664	0.547	.	.
Dose1	34.83	0.652	35.56	0.796	.	0.502	0.387	.	.
Dose2	36.11	0.975	35.56	0.825	.	.	0.998	.	.
Dose3	36.27	0.985	35.56	0.844	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE SURVWT  ( Survivor Wt (d14) )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.971         0.147          1.088      0.361    USE PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  15   281.50    26.12       7.29       10.11         268.30,  294.70
  Dose1 16   280.01    23.68       5.92        8.46         267.40,  292.63
  Dose2 15   290.55    14.86       3.84        5.11         282.33,  298.78
  Dose3 16   287.25    23.10       5.78        8.04         274.94,  299.56

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl       280.40   205.70     316.40         .                  .
  Dose1      275.70   235.10     333.20      100.27              -0.27
  Dose2      288.60   269.10     322.40      104.05              -4.05
  Dose3      287.20   233.50     318.80      102.86              -2.86

*****************************************************************************
PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Analysis of Variance (ANOVA) - overall F-test
     Numerator df    Denominator df    F-stat       P-value
           3           58               0.88        0.455

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level    Mean   Dunnett  Isotonic  Williams                Tukey p-values
                p-value    mean     p-value   Dose1   Dose2   Dose3   Dose4   Dose5

 Ctrl   279.25    .       284.25      .       1.000   0.538   0.768    .       .
 Dose1  280.01   0.779    284.25     0.809     .      0.582   0.810    .       .
 Dose2  290.55   0.986    284.25     0.837     .       .      0.978    .       .
 Dose3  287.25   0.961    284.25     0.856     .       .       .       .       .

 SUMMARY                    NOEC            LOEC
   Dunnett                   Dose3           >highest dose
   Williams                  Dose3           >highest dose
```

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE FOOD  ( Food Consumption )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.944         0.005          0.718      0.545    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16   138.26    20.34       5.09       14.71         127.42,  149.10
  Dose1 16   152.33    28.14       7.03       18.47         137.34,  167.32
  Dose2 16   148.61    26.56       6.64       17.87         134.46,  162.77
  Dose3 17   136.81    23.29       5.65       17.02         124.84,  148.78

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl       136.50   111.20     174.20         .                    .
  Dose1      143.75   123.60     205.60      110.18               -10.18
  Dose2      143.10   101.40     204.60      107.49                -7.49
  Dose3      138.00   101.90     186.30       98.95                 1.05

*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                3.08       0.380

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl     136.50                    .                      .
  Dose1    143.75                  1.000                  0.900
  Dose2    143.10                  1.000                  0.906
  Dose3    138.00                  1.000                  0.514

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE WTGAINM  ( Male wt gain )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.989         0.830          5.224      0.003    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  16    73.56    64.99      16.25       88.36          38.92,  108.19
  Dose1 16   145.08   126.16      31.54       86.96          77.86,  212.31
  Dose2 16   112.06   104.37      26.09       93.14          56.44,  167.67
  Dose3 15   101.69    62.24      16.07       61.21          67.22,  136.16

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        76.65   -29.20     193.30         .                    .
  Dose1       97.00    -9.70     392.40      197.24               -97.24
  Dose2      134.05  -116.80     249.70      152.34               -52.34
  Dose3      110.80   -11.20     218.70      138.24               -38.24

*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                3.22       0.358

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      76.65                    .                       .
  Dose1     97.00                  1.000                   0.934
  Dose2    134.05                  1.000                   0.901
  Dose3    110.80                  1.000                   0.805

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

```
Mallard repro, Saflufenacil, MRID 471279-16
ANALYSIS RESULTS FOR VARIABLE WTGAINF  ( Female wt gain )

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.
  Shapiro-Wilks  Shapiro-Wilks    Levenes    Levenes   Conclusion
    Test Stat      P-value       Test Stat   P-value
      0.994         0.991          5.327      0.003    USE NON-PARAMETRIC TESTS

*****************************************************************************
BASIC SUMMARY STATISTICS
 Level  N     Mean    StdDev      StdErr    Coef of Var    95% Conf.Interval
  Ctrl  15    48.03    78.55      20.28      163.55           4.53,   91.52
  Dose1 16    41.07    46.31      11.58      112.77          16.39,   65.75
  Dose2 16    70.63    65.24      16.31       92.37          35.87,  105.40
  Dose3 15    11.55   107.13      27.66      927.29         -47.77,   70.88

 Level       Median     Min       Max    %of Control(means)   %Reduction(means)
  Ctrl        43.50   -74.90     212.20         .                    .
  Dose1       32.10   -16.40     132.60       85.51                14.49
  Dose2       93.20   -61.70     158.60      147.07               -47.07
  Dose3       45.30  -163.30     180.20       24.06                75.94

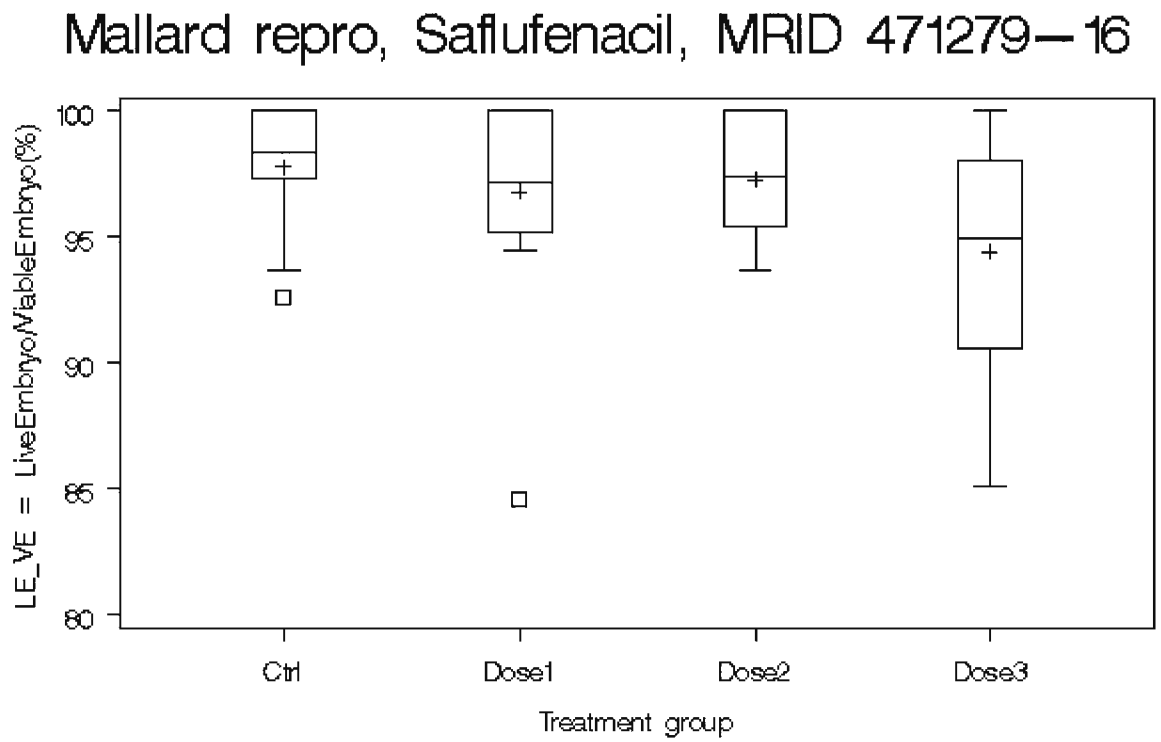
*****************************************************************************
NON-PARAMETRIC ANALYSES    - use alpha-level=0.05 for all tests
    Kruskal-Wallis test - equality among treatment groups
     Degrees of Freedom   TestStat    P-value
           3                2.95       0.400

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

 Level     Median      MannWhit(Bon adjust)p-value    Jonckheere p-value
  Ctrl      43.50                    .                       .
  Dose1     32.10                  1.000                   0.406
  Dose2     93.20                  1.000                   0.854
  Dose3     45.30                  1.000                   0.423

 SUMMARY                      NOEC            LOEC
   MannWhit (Bonf adjust)     Dose3           >highest dose
   Jonckheere                 Dose3           >highest dose
```

Box Plots:


Mallard repro, Saflufenacil, MRID 471279–16
LE_VE = LiveEmbryo/ViableEmbryo(%)
100
95
90
85
80
Ctrl
Dose1
Dose2
Dose3
Treatment group